

Do Interactive Technologies Enhance Online Students' Engagement? Insights from a Post-Graduate Guidance and Counselling Course

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Abstract

Students who study university courses online have a higher level of attrition compared with their on-campus counterparts, so online student engagement has become a contemporary concern for teaching faculty. The issue of student engagement is particularly acute in fields such as Guidance and Counselling in Education, which have not traditionally been taught online. Online student engagement suggests that learning success can be enhanced if students are given opportunities to engage cognitively, behaviourally, and affectively. This study took a pragmatic research approach using design-based research to explore whether interactive technologies, which are learner-centred and promote active and participatory learning, can enhance online student engagement. Data were gathered at a mid-sized regional Australian university in a post-graduate Guidance and Counselling course and analysed in response to Redmond et al.'s (2018) online engagement framework for higher education. The results provide specific insights into how three interactive technologies—Padlet, Google Docs and video-embedded quizzes—engaged online students. They show that students valued learning with technology and that all three technologies promoted engagement across the various dimensions. As online counselling courses become more widely accepted, further knowledge is needed about how best to engage the range of students who are studying for people-centred professions such as counselling.

Keywords: Online student engagement; Higher education; Interactive technologies; Guidance and Counselling education

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Introduction

Over the last two decades, universities have moved increasingly to online modes of delivery. Online education offers flexibility and accessibility to higher education for students who are otherwise unable to undertake traditional on-campus study because of family and work commitments or geographical constraints (Snow & Coker, 2020). Online education has been growing steadily (Morris et al., 2020), but its uptake significantly increased when the COVID-19 pandemic closed down educational institutions across the world, triggering a rapid pivot from face-to-face or blended modes of teaching and learning to fully online (Bedi, 2023). According to UNESCO, 194 countries and regions temporarily closed their educational institutions due to the pandemic, affecting more than 1.5 billion students worldwide (Torun, 2019). Challenges were certainly felt at scale as universities had to “invest in new technologies and update their existing IT [information technology] infrastructure” and “students and academic staff were forced to learn new technologies and to adjust quickly to the new approaches to learning and teaching” (O’Dea & Stern, 2022, p. 437). As part of this adjustment, the issue of online student engagement came to the fore due to its links with positive learning outcomes, student retention, and student completion rates (Bedi, 2023; Tualaulelei et al., 2022).

The issue of student engagement is particularly acute in fields such as Guidance and Counselling in Education, which have not traditionally been taught online. Counsellor educators conventionally use face-to-face teaching to train educational counsellors within a humanistic and experiential framework (Pipoly, 2013). The profession has a “high touch” nature and it values face-to-face interactions, the evaluation of verbal and nonverbal communication skills, and rapport-building (Watson, 2012). These present differently in an online environment. For example, verbal interactions may be shorter, nonverbal communication more difficult to read or people may feel a level of disconnect through lack of direct eye contact. The current generation of counselling students is also different, with at least one study (Koltz et al., 2017) arguing for variations in the way counselling is taught to millennial students, who may be more tech-savvy, socially and environmentally conscious, and self-focused, compared with other generations. As online counselling courses become more widely accepted, further knowledge is needed about how best to engage the range of students who are studying for professions such as counselling that are heavily people-centred.

To explore these issues, this article presents a study that used design-based research to understand online student engagement. Specifically, it explores whether “interactive” technologies—defined as those that are learner-centred and promote active and participatory learning (Anderson, 2008; Garrison, 2017; Pifarre, 2019)—enhance students’ engagement with online learning. The literature review provides an overview of three key areas: research in online learning and student engagement, interactive technologies and online student engagement, and online counselling education. Next, the theoretical framework, context, and methods of the current study are described, followed by results. The subsequent discussion argues that interactive technologies promote student engagement and active learning across several dimensions. This is especially important for fields like Guidance and Counselling that are predicated on human interaction and communication. Our study’s contribution is in teasing out how interactive technologies enhance specific dimensions of online student engagement. These insights can assist university educators to use these technologies more intentionally.

Literature Review

Online Learning and Student Engagement

Online learning, also known as e-learning, is a subset of distance learning and it is commonly accepted to mean learning through the internet, or “online” (Anderson, 2008; Garrison, 2017). Online learning involves various modalities and combinations of technologies integrated into learning management systems such as Moodle, Blackboard, or Canvas. Some institutions offer courses fully online while others provide blended learning (face-to-face and online classes). The online environment offers learners opportunities and benefits that may be absent from face-to-face experiences. For example, Arasaratnam-Smith and Northcote (2017) highlight four online advantages: “social egalitarianism” where students enter online environments as equals; time for students to provide reasoned and reflective responses; social agency, where students are free to interact with the individuals and groups they want to, and an emphasis on interactions through verbal and written means. Technologies can further increase students’ digital skills, deepen their discipline knowledge, and give diverse learners the flexibility to study through their preferred modes of engagement (Farrell & Brunton, 2020; Rajabalee et al., 2020). Online educators may create a sense of community through mini-lectures, group discussions, and the use of designated social media (Arasaratnam-Smith & Northcote, 2017). Post Covid-19, however, students reported that the decreased interaction with peers and educators and the lack of social connection negatively affected their online learning experiences (Hollister et al., 2022; Redmond et al., 2023). Interactive technologies therefore play a key role in students’ participation and success with online learning.

The term used to describe student interest or interaction with learning is “online student engagement” which is commonly viewed as a multi-faceted construct. Hollister et al. (2022) suggested that researchers largely agreed on three dimensions of student engagement: behavioural, cognitive, and affective. Their definition drew from Coates’ (2007) typological model, among others, which described online and campus-based students’ styles of engagement as being a mix of dependent/collaborative styles and intense/passive styles. A slightly different definition was put forth by Kahu and Nelson (2018) who proposed three dimensions: emotional, which indicates a student’s interest and enthusiasm; cognitive, which focuses on deep learning and self-regulation; and behavioural, which includes the student’s participation, time, effort, and interaction. Some studies equate engagement with interaction and connection to other learners, the instructor, and course content (Dixson, 2015; Martin & Bolliger, 2018), while others embed engagement within models such as Garrison’s Community of Inquiry, which emphasises students’ social presence, cognitive presence, and instructors’ teaching presence (Rioch & Tharp, 2022). While researchers have not yet reached a consensus on a definition, it is clear that online student engagement differs from face-to-face engagement. It is also evident that student engagement involves a balance between what the student needs or desires through study, whether that be cognitive, social, or emotional, and what educators and institutions think students need (i.e., certain levels of cognitive advancement, specific behaviours that reflect time and effort put into study, or collaboration with peers to enhance graduate outcomes etc.).

Perhaps the most holistic framework has been proposed by Redmond et al. (2018). Through a review of relevant research and consultation with international experts in the field,

Redmond et al. (2018) created an online engagement framework for higher education with five dimensions which are summarised in Table 1: social, cognitive, behavioural, collaborative and emotional. Although the authors did not include a developed instrument for measuring each of these dimensions, they identified indicators that could be used to develop measurement methods. The authors recommended the framework as an “audit tool or point of reference” (p. 196).

Table 1

Online Learning Engagement Framework (Redmond et al., 2018, p. 190)

Dimension of Engagement	Indicators
Social	Building community, creating a sense of belonging, developing relationships, and establishing trust
Cognitive	Thinking critically, activating metacognition, integrating ideas, justifying decisions, developing deep discipline understandings, and distributing expertise
Behavioural	Developing academic skills, identifying opportunities and challenges, developing multidisciplinary skills, developing agency, upholding online learning norms, supporting and encouraging peers
Collaborative	Learning with peers, relating to faculty members, connecting to institutional opportunities, and developing professional networks
Emotional	Managing expectations, articulating assumptions, recognising motivations, and committing to learning

As shown in Table 1, social engagement is when online students create purposeful and trusting relationships with others. Cognitive engagement is “the active process of learning” (p. 191), while behavioural engagement involves students “demonstrating positive learning behaviours and attitudes” (p. 193). Collaborative engagement includes “the development of different relationships and networks that support learning, including collaboration with peers, instructors, industry, and the educational institution” (p. 194). Emotional engagement is “related to feelings or attitudes towards learning” (p. 195). This framework informs the current study for two reasons: Each dimension is comprehensive and research-based, and the framework is specific to online higher education.

Interactive Technologies and Online Student Engagement

“Interactive technologies” are online and virtual tools that enable students to communicate and learn synchronously or asynchronously (Getenet & Tualaulelei, 2023; Pifarre, 2019). Unlike static media such as documents and videos, interactive technologies require students to actively engage, respond, or manipulate them. There are also a number of emerging technologies that are interactive such as virtual worlds like *Second Life*, social media, augmented/virtual reality, artificial intelligence, and educational (or “serious”) games. But many of these tools have not been widely adopted in higher education. University educators generally adopt tools that are free or low-cost, readily accessible to both students and staff, and those that conform with university policies on student privacy and technology use. For example, Dianati et al. (2020) investigated Padlet, Kahoot! and Cirrus technologies, and Licorish et al. (2018) similarly studied Kahoot! quizzes. Both studies found that student learning and engagement improved with the use of technology-enhanced educational activities. Some studies have focussed on a technology’s influence on specific dimensions of student engagement. Padlet, for instance, has been found to promote cognitive engagement (Gill-Simmen, 2021) and collaborative learning (Mehta et al., 2021). Few studies, however, have focussed on technology’s impact on holistic student engagement beyond one or two dimensions.

While there are a great number of interactive technologies being used in universities across the world, there are emerging bodies of research around three common ones, namely, Padlet, Google Docs, and video-embedded quizzes. Padlet is a web 2.0 tool which creates virtual walls where files, documents, images, and videos can be posted (Wallwisher, 2022). When embedded within learning management systems, students can see real-time updates of the Padlet. Google Docs is a suite of office applications (spreadsheet, word processing, presentation slides) that allows collaboration and sharing. When used in synchronous online tutorials, Google Docs allows live editing of documents that can later be shared with students asynchronously for their contributions. Both technologies have been found to increase students’ motivation and interest and deepen their critical thinking and reflection skills (Gill-Simmen, 2021; Heggart & Yoo, 2018; Mehta et al., 2021; Tran & Lamar, 2020). Another technology is video-embedded quizzes, where brief quizzes are placed within video resources. A number of studies have highlighted their effectiveness for engaging students with course content, although some studies have returned mixed results around their effects on student learning (Deng & Gao, 2023; Haagsman et al., 2020; Rice et al., 2019; Singh et al., 2023). As these technologies become more widely used, research is needed to understand which aspects of student engagement they can be used to enhance.

Online Counselling Education

Counselling education is increasingly being delivered online whether students aim to offer traditional or online counselling. Along with the pandemic-fuelled move to online learning, there has also been an increase of individuals in the community seeking online counselling such as web counselling, virtual counselling, and e-counselling (Hennigan & Goss, 2016; Paterson et al., 2019; Pipoly, 2013). Research has explored the effectiveness of different course delivery methods (e.g., face-to-face, online, or hybrid) by examining students’ beliefs about their ability to gain effective counselling skills (Hennigan & Goss, 2016; Watson, 2012). Traditional counselling has established that students who feel confident using their clinical

skills in face-to-face settings provide a higher quality of counselling services to clients, but Watson (2012) found that online students reported higher levels of self-efficacy, personal motivation, and self-confidence compared with face-to-face students. In addition, in a study exploring the equivalence of online compared with on-campus counselling education, Holmes and Reid (2017) found that not only were learning outcomes equivalent, but student evaluations of their learning were also similar. As online counselling education is on the rise and it promises equivalence with face-to-face training, a sharper focus is needed on the affordances of various technologies for promoting the skills and dispositions required of counselling professionals.

Some core threshold concepts in counselling education relate to interpersonal skills, relationship-building, and ethics, which have been reframed through online education. For instance, a longstanding goal of most counsellor education programs is to foster students' confidence in their abilities to work effectively with clients (Watson, 2012). A key concern of critics has been that online education does not provide sufficient opportunities for the social engagement needed "for a professional role emphasising the importance of quality of relationships" (Scholl et al., 2017, p. 197). Counsellor educators have, therefore, had to find innovative ways to observe students' non-verbal behaviours, empathy development, and counselling and communication skills throughout their training. Magill et al. (2022) scoped the technologies reported in the literature and they found three main types for training and monitoring counselling skills: avatar-interfaces, video-interfaces, and performance monitoring programmes. The authors identified the advantages of these technologies (scalability, resource efficiency, standardisation, and immediacy of feedback). However, they also suggested that future research focus on "understanding factors, whether individual or institutional, that maximise user's sustained engagement and adherence" (p. 334). Outside the scope of their review was the user experiences of these technologies. Partially addressing this aspect, Roth et al. (2019) studied how counsellors-in-training perceived their online education, and they found that students were satisfied with their course if they could gain advanced knowledge, if the course was convenient, if they could build strong connections with their peers, and if the course enhanced their self-efficacy. The evidence points to a fundamental role of technology in helping students deepen their engagement with the social and emotional aspects of counselling education.

As technology evolves, so too will the nature of counselling. Issues around ethics and legalities have emerged as key concerns for some researchers (e.g., Coker et al., 2021; Sheperis et al., 2020), while others have explored how technology can facilitate and enhance counsellor education to ensure that graduates are professionally prepared (Cicco, 2013; Cook, 2016; Snow et al., 2018). According to Pipoly (2013, p. 49), "Online counselling . . . challenges the foundation upon which the counselling field was built," so technology should enhance and promote the values and skills of the profession rather than undermine them. In a review of online counsellor education, Coker et al. (2021, p. 41) recommended research into "program development that utilizes various technologies" due to the affordances and possibilities presented by emerging and disruptive technologies such as virtual reality. To our knowledge, there is also scant research about the role artificial intelligence will play in this area.

Given the increasingly widespread use of technology within counselling and counselling education, and the urgent need for a more robust evidence base that helps guide online counsellor education, the present study explored three interactive technologies: Padlet, video-

embedded quizzes, and Google Docs, and their effectiveness in enhancing university students' engagement in a foundational post-graduate counselling course. The research question guiding the present study was:

How do interactive technologies enhance specific dimensions of online student engagement for students studying Guidance and Counselling?

Methodology

Research Approach and Design

The current study is grounded in the philosophical tradition of pragmatism, which emphasises practical outcomes in research. Pragmatist methods allow for flexible, real-world inquiry and they encourage the investigation of problems in context (Dewey, 1916; Peirce, 1905). Pragmatism values what works best in real-world settings over strict adherence to traditional research methodologies, and it encourages the blending of qualitative and quantitative methods to find effective, actionable solutions (Biesta, 2010). From this perspective, a design-based research approach was considered appropriate for the current study. Design-based research is appropriate for technological interventions (Zheng, 2015) and it can be used for short-term projects (Pool & Laubscher, 2016). It encourages the collection of various types of data (McKenney & Reeves, 2013) and it is typically implemented in phases.

The first phase of this three-phase study was reported in Getenet and Tualaulelei (2023). That phase gathered background information through the implementation of the interactive technologies across two undergraduate courses, and it resulted in initial professional learning strategies and a prototype of a professional learning guide. The second phase involved the current study where the professional learning ideas from the first phase were utilised, refined, and revised. For example, we learned from the first phase that quizzes placed at the end of lecture videos tended to be ignored and that no matter how intuitive we thought technologies were, they always needed explanation to ensure all students could participate. We were also able to refine our data collection tools from phase one for use in this phase.

Context and Participants

The study was conducted at a mid-sized regional Australian university in an online post-graduate Guidance and Counselling course in a Master of Education programme. Over 75% of students at this university study online, and students in this particular course were all teacher-qualified and mature-aged (over 25 years old). Most students studied whilst working as schoolteachers or counsellors. The course was designed to provide students with theoretical content, counselling frameworks, as well as counselling skills-based interventions. Students had the opportunity to role-play their skills by video and be evaluated by teachers. The course also emphasised ethical conduct. The course duration was 13 weeks or one semester.

The technologies chosen for investigation in this study were Padlet (Wallwisher, 2022), video-embedded quizzes, and Google Docs. These tools were selected due to their availability to students and staff, their compliance with university use policies and the convenience of

integrating them within the Moodle learning management system alongside other technologies already used in the course. Padlet activities in this course were embedded within each of the six course modules and were structured as reflective exercises based on key module content of counselling skills, communication, problem-solving skills, ethical behaviour, leadership skills, and multicultural competency. Video-embedded quizzes were embedded in the recorded lecture videos. Google Docs was used for pairs to collaborate on case studies. These technologies are interactive in the sense that users manipulate and interact with the technology and the technology is responsive to user input (Pifarre, 2019). Access for all technologies was via a standard web browser, making the tool relatively easy for students and staff to access.

Data Collection

After ethical approval from the relevant university committee (Approval No. H20REA133), data were collected through a pre- and post-survey attached in the Appendix. To ensure the validity of the survey, the items were developed based on Redmond et al.'s (2018) online engagement for higher education framework. In addition, we drew upon our experiences of researching online student engagement in the design process of the survey to ensure its content validity (Getenet & Tualaulelei, 2023; Getenet et al., 2022; Tualaulelei et al., 2022). The surveys were also piloted in the first phase of the project to assess the clarity, relevance and appropriateness of the items which further helped to strength the validity of the survey. All 158 students in the course were invited via email from our research assistant to participate in the anonymous surveys which asked students about their confidence in using and teaching with technology, as well as their views about each of the technologies. The survey was administered online through Google Forms with 5-point Likert scale questions ranging from *strongly disagree* (1) to *strongly agree* (5). The pre-survey received 39 responses (response rate 24.7%) and the post-survey received 23 responses (response rate 14.6%). Table 1 summarises the demographics of the survey participants for the pre- and post- surveys. It shows that most of the participants were female, most were aged between 35 and 49 years of age, most studied part-time, and almost all students studied off-campus.

Table 2

Summary of Pre- and Post-Survey Participants

Features		Pre	Post
Gender	Female	36	21
	Male	3	2
Age	25-34 years	7	3
	35-49 years	26	13
	50+ years	6	7
Study load	Full time	6	5
	Part-time	33	18

Study mode	>75% off campus	0	1
	100% off campus	39	21*

* 1 student did not respond to this question in the post-survey

Data Analysis

Data analysis was guided by Redmond et al.'s (2018) framework to gauge students' engagement on the cognitive, behavioural, emotional, collaborative, and social dimensions. SPSS (Version 29.0.1.0) was used to derive results and descriptive statistics were used to summarise these. We used content analysis for the small amount of qualitative data gathered from the survey's open-ended questions.

Results

The survey results show no significant differences between the pre- and post- mean ratings. Table 3 shows that generally, students were neutral or agreed that they were confident using technology for learning (Pre M=3.95, Post M=4.00). As teachers, most of the students were neutral or agreed that they were confident teaching with technology (Pre M=3.64, Post M=3.87), but they agreed that learning with technology was important (Pre M=4.08, Post M=4.30). They further agreed that learning with technology would influence how they taught with technology in the future (Pre M=4.10, Post M=4.17). Students were neutral or agreed that university courses offered good opportunities for learning with relevant technologies (Pre M=3.92, Post M=4.04). These figures indicate that for students, technology was an accepted tool for learning and teaching both currently and for the future, confirming the importance of learner-interface interactions for online learning (Anderson, 2008).

Table 3

Students' General Perspectives of Technology Use

Items	Pre		Post	
	Mean	SD	Mean	SD
I am confident using technology for learning at the University	3.95	0.916	4.00	0.798
I am confident teaching with technology	3.64	0.932	3.87	0.968
Learning with technology is important to me	4.08	0.739	4.30	0.703
Learning with technology will influence how I teach with technology in the future	4.10	0.718	4.17	0.717
The university courses offer good opportunities for learning with relevant technologies	3.92	0.703	4.04	0.706

Strongly agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly disagree = 1

Table 4 summarises student responses to the pre- and post-surveys and it is worthwhile examining the results for each technology for comparison and contrast.

Table 4

Student Responses to Pre- and Post-Surveys Mean and SD

Engagement Dimension and Indicators	Padlet				Video-embedded quizzes				Google Docs			
	Pre		Post		Pre		Post		Pre		Post	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Cognitive												
Think critically	3.6	0.59	3.26	1.29	3.46	0.62	3.43	1.20	3.15	0.71	3.35	1.15
Develop deep discipline understandings	3.6	0.59	3.17	1.23	3.46	0.62	3.39	1.20	3.15	0.71	3.3	1.11
Use expertise gained from other courses	3.5	0.70	3.22	1.20	3.31	0.55	3.3	1.02	3.36	0.70	3.39	1.16
Behavioural												
Develop academic skills	3.4	0.64	3.13	1.18	3.38	0.62	3.22	1.04	3.39	0.79	3.35	1.11
Develop agency	3.57	0.65	3.17	1.19	3.27	0.47	3.26	1.01	3.52	0.76	3.35	1.15
Understand online learning norms	3.5	0.65	3.22	1.24	3.31	0.60	3.26	1.01	3.39	0.79	3.43	1.16
Collaborative												
Engage with lecturers or tutors	3.78	0.69	3.3	1.30	3.31	0.60	3.17	0.98	3.36	0.78	3.35	1.15
Connect to opportunities at the university	3.37	0.64	2.96	1.07	3.19	0.50	3.04	0.88	3.18	0.68	3.09	1.08
Develop professional networks	3.43	0.65	2.91	1.13	3.19	0.50	3	0.91	3.24	0.87	3.04	1.06
Social												
Create sense of belonging	3.43	0.78	3.17	1.20	3.23	0.58	3	0.91	3.24	0.94	3.09	1.04
Develop relationship with others	3.5	0.70	3	1.09	3.19	0.50	3	0.91	3.36	0.86	3.32	1.09
Develop sense of community among others	3.5	0.70	3.22	1.20	3.23	0.52	3	0.91	3.45	0.79	3.09	1.04
Emotional												
Become interested in the course	3.5	0.63	3.26	1.21	3.38	0.75	3.48	1.08	3.3	0.77	3.22	1.04
Reduce my anxiety about learning	3.43	0.57	3.17	1.23	3.31	0.68	3.26	1.14	3.21	0.65	3.26	1.10

Commit to learning	3.53	0.63	3.26	1.25	3.38	0.70	3.39	1.12	3.36	0.65	3.17	1.03
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Strongly agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly disagree = 1

Padlet

Post-survey figures about Padlet were generally lower than the pre-survey figures across all five dimensions of engagement. Students were neutral about Padlet's contribution to their cognitive, behavioural, social, and emotional engagement. One student described how Padlet facilitated a student's social engagement through a sense of community with their peers, stating that "Padlet was used early in this course and I enjoyed reading and learning from other students' responses." The data supports the idea that online learners require opportunities to reflect on what they are learning. This helps them to contextualise and internalise learning (Garrison, 2017). Interestingly, students tended to disagree that Padlet helped with their collaborative engagement. The lower mean score for collaborative engagement (made up of engaging with lecturers or tutors Post M=3.35, connecting to university opportunities Post M=3.09, and developing professional networks Post M=3.04) was partially explained by how Padlet was used in this course. It was specifically aimed at enhancing students' cognitive engagement by asking them to reflect on their understandings, and behavioural engagement through having students post their ideas for the cohort. In other words, Padlet was not specifically aimed at enhancing collaborative engagement (i.e., for students to connect to opportunities at the university or to develop professional networks).

Video-Embedded Quizzes

Similar to the Padlet results, the post-survey mean rating about the video-embedded quizzes were generally lower than the pre-survey mean ratings across all five dimensions of engagement except for very slight differences in the emotional dimension. In the post-survey results, after students had engaged with the quizzes, they agreed slightly more that the quizzes were helpful for cognitive engagement compared with Padlet. This was also the case with behavioural engagement, where students rated quizzes more useful than Padlet for developing academic skills, developing agency, and understanding online norms. Students appreciated the seamless integration of the quizzes, commenting that "the Panopto quizzes were embedded well in lectures." When asked whether the quizzes helped students become interested in the course and commit to learning (which are elements of emotional engagement), the mean rating from the post-survey was slightly higher than the pre-survey results. Quizzes may therefore play a role in helping students feel emotionally engaged with online learning. This is consistent with students' higher mean rating of quizzes over Padlet on the collaborative elements of connecting to opportunities at university and developing professional networks.

One student pointed out the importance of aligning quizzes closely to course content, writing that:

Panopto quiz would have been good for a pre and post assessment of understanding, but the questions often did not relate to the content in the corresponding lecture. I think this would be a great tool, but do not feel that it was used very effectively in this course.

This comment highlights the need for relevant and strategically placed quizzes so that students can maximise their learning opportunities.

Google Docs

Like the Padlet and video-embedded quiz results, the post-survey figures for Google Docs were mostly neutral. However, the post-survey mean rating for the cognitive dimension was slightly higher for the post-survey compared with the pre-survey. This tentatively suggests that Google Docs engaged students cognitively slightly more than the other two technologies. Google Docs also appeared to engage students emotionally, particularly in reducing their anxiety about learning, an element that had a mean rating slightly higher in the post-survey compared with the pre-survey. Our results suggest that cognitive and emotional engagement may be the result of learners being actively involved in learning activities.

Overall, students were neutral towards the interactive technologies that were trialled, although qualitative responses to the post-survey provided further insights. Several students were concerned that the technologies created extra work, as exemplified by this comment:

Google Docs, Padlet or Panopto are just tools . . . the more platforms are introduced, the more time wasting distracts from learning as students navigate the variety of platforms - a good course should be able to allow one clear access point with everything embedded and no requirements for downloads and navigating. Already too many spots to access to get all information. Just gets distracting rather than enhancing learning.

Course design should therefore consider which technologies are easy to use, access, and understand for students, and take care to integrate technologies as seamlessly as possible. Educators will need to guide students more with technologies such as Google Docs which may initially involve more instruction and guidance to use.

Discussion

The research question guiding the present study was: *How do interactive technologies enhance specific dimensions of online student engagement for students studying Guidance and Counselling?* Redmond et al.'s. (2018) online engagement framework was used as a guide for this design-based research project. The students in this study agreed that technology was important for both learning at university and for their future professional roles as counsellors. This was reflected in the high mean scores across Table 3, for example, they indicated strong agreement that learning with technology is important to them (Pre M=4.08, Post M=4.30), and that it will influence how they use technology in the future (Pre M=4.10, Post M=4.17). These results indicate that students value the role of technology in their current study but also anticipate its relevance in their future professional practice as counsellors. Results also showed that Padlet promoted cognitive, behavioural, social and emotional engagement but not necessarily collaborative engagement. We surmised that this was due to Padlet not being

specifically used to promote collaboration. Students considered video-embedded quizzes more engaging across all five dimensions, including collaborative engagement. The results also show some potential for quizzes to promote students' emotional engagement through increasing their interest in and commitment to learning online. Google Docs was reported by students to enhance their cognitive and emotional engagement. The survey showed that students were generally neutral towards all three technologies, but they preferred them to be used purposefully and with "one clear access point." Student neutrality was likely due to the survey responses being self-reported, as well as students possibly feeling overloaded by multiple technologies and platforms for learning.

These results are important because they tease out the aspects of online student engagement that can be enhanced by interactive technologies. Advantages highlighted by Arasaratnam-Smith and Northcote (2017) were particularly evident. Padlet promoted social egalitarianism between students as contributions could be made anonymously. All three technologies allowed for asynchronous use, meaning that students had time to consider and craft their responses. Padlet also promoted social agency where students could post and respond to peers. Padlet and Google Docs further helped students hone their communicative skills as they discussed issues or solved problems and recorded their notes. We found that the interactive technologies helped students become more interested in what they were learning and commit to their studies, in alignment with the findings of Bedi (2023) and Redmond et al. (2023). Importantly, online students are not passive recipients of knowledge that is merely accessed online; they interact with course content and with peers and educators to negotiate and create knowledge.

The three technologies in this study further promoted students' self-efficacy with key tenets of counselling education. Contemporary counselling students view online counselling as "a natural part of their counselling skills portfolio" (Paterson et al., 2019, p. 296), so it is important that online education uphold and promote the profession's foundational skills and dispositions. In the current study, all three technologies built up students' sense of self-efficacy with counselling practices. The technologies encouraged students to use clear verbal and written communication, develop rapport with each other, and to gain increased confidence with the profession's language, ways of working, and interacting (see Table 4). This supports Roth et al.'s (2019) idea that online students want peer connections as well as advanced knowledge and skills. It also extends upon findings from Watson (2012) and Holmes and Reid (2017) who suggested that online counselling education may be as effective as traditional face-to-face modes of learning. Online counselling education might offer a better mode of training for online counselling provision and delivery. Our results further respond to the critique highlighted by Scholl et al. (2017) regarding whether online counselling education can provide sufficient opportunities for social engagement. In this study, students were neutral about the three technologies promoting social engagement, so future research can explore other technologies that can be used.

As the demand for online counselling services increases (Hennigan & Goss, 2016; Pipoly, 2013), the ability of counsellors to develop relationships and rapport-building through technology will also gain importance. Access to Padlet in the current study allowed students thinking and response time. They could present reasoned and timely responses at their leisure without the social pressures and time-restrictions prevalent in face-to-face communication. It

helped that the Padlets were accessible for the entire semester. This echoes findings from Torun (2019) and Roth et al. (2019) that students value convenience with online platforms. The implementation of interactive technologies allows diverse learners to learn at a flexible pace. Additionally, it gives counselling students a sense of the benefits and challenges of using technology with future clients who may prefer to post thoughts anonymously in group settings, or who may need the extra time to collect their thoughts. Understanding these nuances of online interaction is important because contemporary counselling clientele have become more comfortable with seeking online or distance counselling. It may not be long before counselling is provided through avatars combined with artificial intelligence (Coker et al., 2021; Magill et al., 2022), further influencing the nature of online counselling education and online counselling itself. We recommend that counselling educators utilise technologies that are accessible, engaging, and seamlessly integrated into the overall learning experience. Our study may provide insights about available technologies and student preferences for counselling education.

Conclusion

As online counselling education is here to stay (Coker et al., 2021), the technologies used in online education warrant more attention in terms of their value for engaging online learners and upholding the values of the counselling profession. The current study investigated how three interactive technologies enhanced student engagement in a post-graduate educational counselling course. The study's participants agreed that technology was important for online study and for the counselling profession. Results from a pre- and post-surveys revealed that: Padlet promoted cognitive, behavioural, social, and emotional engagement but not necessarily collaborative engagement; video-embedded quizzes promoted engagement across all five dimensions; and Google Docs enhanced cognitive and emotional engagement. Overall, however, students were neutral about all three technologies, expressing neither agreement nor disagreement that one technology was more engaging over the others. What they valued instead was accessibility and clarity with whichever technological tools were used. The study's results may have limited generalisability due to its focus on one course in one mid-sized university and the limited data set. This can be remedied with future research of samples that are much wider in scope exploring, for instance, a broader selection of university courses and technologies.

Counsellor educators are encouraged to be strategic with how they integrate technology into their online counselling courses. Students studying guidance counselling for education especially need to be prepared to become "available in digital places that young people 'inhabit'" (Paterson et al., 2019, p. 301). To this end, more studies are needed to help unpack specific technologies and their impacts on online student engagement, as well as studies that explore online client engagement so that the technologies used in counsellor education are as relevant and responsive as possible.

Declarations

The authors declare they have no competing interests.

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